

Single-Digit Inflation Targeting: Does it Promote Economic Growth?

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Abstract

The paper investigates whether single-digit inflation promotes economic growth with annual time series data from South Africa (1965-2010). Evidence from the analysis suggests that single-digit inflation undermines economic growth in the long run. The paper, therefore, submits that inflation targeting in the single-digit threshold may not be in the best interest of a developing economy like South Africa.

Keywords: Inflation, South Africa, Economic Growth, financial intermediary, Size

1. Introduction

Many policy makers, especially those in Africa, resort to inflation targeting as a major economic policy in which the focus is to maintain inflation rates within the single digit zone. Theoretically, this is in tandem with the postulation of Bruno (1993) that "getting inflation down to single digits is important even for longer-term growth reasons" (p. 38). However, juxtaposing this position against the mixed threshold levels reported by the nonlinear models investigating growth-inflation connection warrants a study that narrows the discourse on growth-inflation nexus down to the relationship between single-digit inflation rates and growth.

It is trite that the empirical studies on growth-inflation nexus have been kinked towards determining the threshold level above which inflation hurts economic growth. However, what is palpably clear from these studies is that although most of them suggest single-digit inflation threshold level above which inflation begins to hurt growth, yet different threshold levels have been reported (Frimpong and Oteng-Abayie, 2010; Munir and Mansur, 2009; Hussain, 2005; Burdekin *et al.*, 2004; Gillman *et al.* 2002; Khan and Senhadji, 2001; Ghosh and Phillips, 1998; Bruno and Easterly, 1998; Sarel, 1996; Fischer, 1993). This has created a knowledge gap as to the kind of relationship that exists between single-digit inflation and economic growth.

The current study has, therefore, been designed to fill this knowledge gap by examining the relationship between single-digit inflation rates and economic growth with time-series data from the Republic of South Africa. The study seeks to answer one question: Does single-digit inflation promote economic growth?

The rest of the paper is sectionalized as follows. Section 2 reviews the extant literature. This is followed by model and data section. Estimation results section is followed by sensitivity analysis section. Conclusion and limitations of the study section ends the paper.

2. Empirical Studies

Some of the empirical studies on growth-inflation nexus allude to a positive relationship between single-digit inflation rates and economic growth. Khan and Senhadji (2001) report that threshold level of inflation above which inflation significantly slows growth is 11-12 percent for developing countries. Impliedly, the authors suggest that inflation rates below 11% promote economic growth in developing countries. This finding has since been confirmed in Ghana by Frimpong and Oteng-Abayie (2010) who analyze the threshold effect of inflation on economic growth in Ghana for the period of 1960-2008 and report 11% threshold level. Based on a panel data of Organization for Economic Cooperation and Development (OECD) and Asia-Pacific Economic Cooperation (APEC) countries, Gillman *et al.* (2002) indicate that reduction of high and medium inflation (double digits) to moderate single digit figures has a significant positive effect on growth for the OECD countries, and to a lesser extent for the APEC countries. Investigating the effect of inflation on long-term economic growth for a panel of 63 industrial and non-industrial countries, Kremer *et al.* (2009) provide evidence that inflation impedes growth if it exceeds thresholds of 2% for industrial countries and 12% for non-industrial countries. Their study indicates that below these thresholds, the effects of inflation on growth are significantly positive. Espinoza *et al.* (2010) use panel data from 165 countries including oil exporting countries as well as Azerbaijan to examine threshold effect of inflation on GDP growth and provide evidence of single-digit inflation promoting growth. A smooth transition model used over the period of 1960–2007 indicates that for all country groups threshold level of inflation for GDP growth is about 10 percent (except for advanced countries where threshold is much lower). In Pakistan, Mubarik (2005) estimates the threshold level of inflation using annual dataset from 1973 to 2000 and reports 9 percent threshold level of inflation above which inflation is inimical for economic growth.

Apart from the above, there are studies that suggest that not all single-digit inflation rates promote

economic growth. Sarel (1996) finds evidence of a significant structural break at an annual inflation rate of 8 percent. Below that rate, inflation does not have a significant effect on growth, or it may even show a slightly positive effect. For inflation rates greater than 8 percent, the effect is negative, statistically significant, and strong (Sarel, 1996). Using panel regressions and allowing for a nonlinear specification, Ghosh and Phillips (1998) report that at very low inflation rates (around 2-3 percent a year, or lower), inflation and growth are positively correlated. Otherwise, inflation and growth are negatively correlated. Following Khan and Senhadji (2001) in allowing for different threshold effects among the industrial and developing countries and also allowing for nonlinearities in the growth-inflation relationship through utilization of spline estimation techniques, Burdekin *et al.* (2004) find that the turning point for industrial countries is 8 percent, whereas that for developing countries is 3 percent. Hussain (2005) using annual data for the period 1973-2005 in Pakistan suggests that targeting inflation exceeding a range of 4 - 6% will be a deterrent to economic growth in Pakistan. In Malaysia, Munir and Mansur (2009) analyze the relationship between inflation rate and economic growth rate in the period of 1970-2005 and report 3.89% as the threshold value of inflation rate above which inflation significantly retards growth rate of GDP.

Phiri (2010) investigates the level of inflation which is least detrimental towards finance-growth activity for the South African economy by estimating an inflation threshold in a nonlinear finance-growth regression for quarterly data collected between the period February 2000 and July 2010 and presents two-fold findings: (1) inflation has an adverse effect on finance-growth activity at all levels of inflation and (2) the least adverse effects of inflation on finance-growth activity are established at an inflation level of 8 percent. Above and below this level, according to Phiri (2010), real activity losses gradually begin to be magnified the further one moves from the threshold.

The above mixed results provide grounds for our research question: Does single-digit inflation promote economic growth? Answering this question with annual time series data from South Africa expands the frontiers of the literature on the inflation-growth nexus. The choice of South Africa for this study has been informed by the fact it is one of the inflation-targeting African countries with sufficient data needed for the study.

3. Model and Data

The dependent variable in our model is the natural logarithm of GDP per capita. The independent variable is inflation measured as annual consumer price index in South Africa. In line with the objective of the study, inflation is included in the model as a dummy variable which takes the value of 1 in years when South Africa recorded single-digit inflation rates and 0 in years when inflation rates were double digits. Growth-inflation regressions must include other plausible determinants of growth (Ghosh and Phillips, 1998). The study controls for degree of intermediary services (DIS), overall size of the financial intermediary sector (OSFIS), size (SIZE) and openness of the South African economy (OPEN). DIS and OSFIS are proxied by the credit to private sector as a share of GDP and broad money supply as a share of GDP respectively (Saci *et al.*, 2009). SIZE is proxied by the final government consumption expenditure as a share of GDP (Shahbaz, 2009). OPEN is represented by the ratio of exports plus imports to GDP (King and Levine, 1993; Ghosh and Phillips 1998; Zang and Kim, 2007, Saci *et al.*, 2009). We use the natural logarithm of all control variables because according to Sarel (1996), the log transformation eliminates, at least partially, any asymmetry in the data. The Fully Modified Ordinary Least Squares (FMOLS) regression model adopted for the study is stated as:

$$LGDPPC = \delta_1 + \delta_2 DINF + \delta_3 LDIS + \delta_4 LOSFIS + \delta_5 LOPEN + \delta_6 LSIZE + \eta_t \quad (1)$$

Where:

LGDPPC = Log of per capita GDP

DINF = Dummy variable for inflation: =1 if inflation is single digit; =0 otherwise

LDIS = Log of credit to private sector as a share of GDP

LOSFIS = Log of overall size of the financial intermediary sector as a share of GDP

LOPEN = ratio of exports plus imports to GDP

LSIZE = Log of Government Final Consumption Expenditure as a Share of GDP

η_t = stochastic error term

Data for the study have been gathered from the World Development Indicators (WDI) (<http://www.worldbank.org>)

4. Estimation Results

The adjusted R² value of 0.84, reported in Table 1, indicates a strong fit. The F-statistic of 46.91756 statistically significant at 1% level of significance (prob. value = 0.000000) supports the conclusion that the explanatory variables, jointly and significantly influence economic growth. The results in Table 1 show that single digit inflation has a weak, negative significant relationship with economic growth, meaning that as inflation rates are

held in the single digit zone the growth of the South African economy is undermined. Our finding questions the position of Bruno (1993) that "getting inflation down to single digits is important even for longer-term growth reasons" (p. 38) and hoists a red flag over tendency for some governments in Africa to implement monetary and fiscal policies calculated at achieving single-digit inflation rates. Per this result such drives may be counterproductive.

A more developed financial sector provides a fertile ground for the allocation of resources, better monitoring, fewer information asymmetries, and economic growth (Shen and Lee, 2006). Degree of financial intermediary services proxied by credit to private sector as a share of GDP has a strong, positive statistically significant relationship with economic growth, implying that the development of financial intermediary services promotes economic growth. This contradicts a recent investigation into the relationship between finance and growth in South Africa which reports a negative, statistically significant relationship between finance and economic growth (Adusei, 2012). It suggests to us that in periods of single-digit inflation finance is likely to have a positive impact on growth. This lends credence to the assertion by Saci *et al.* (2009) that results either in support or rejection of the role of finance in economic growth are highly dependent on the model specification, the level of development (financial and/or economic) of a country, the choice of financial variables and the econometric technique used.

Size of government measured by government final consumption expenditure as a share of GDP has been found to have a positive, statistically significant relationship with economic, implying that in periods of single digit inflation rates an increase in size of government promotes economic growth.

The overall size of the financial intermediary sector has a weak, negative statistically insignificant relationship with economic growth. The openness of the South African economy has a strong, positive statistically insignificant relationship with economic growth.

TABLE 1: FMOLS REGRESSION RESULTS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	3.579849	1.761546	-2.032220	0.0492**
DINFL	-0.325293	0.173705	-1.872672	0.0688*
LDIS	0.805222	0.383191	2.101361	0.0423**
LOSFIS	-0.063187	0.433123	-0.145888	0.8848
LSIZE	2.148976	0.563895	3.810952	0.0005***
LOPEN	0.543037	0.429341	1.264815	0.2136
R ² =0.86, Adjusted R ² =0.84				
F-stat=46.91756(0.000000)				

***, ** and * represent 1%, 5% and 10% significance levels

5. Sensitivity Analysis

To check the robustness and specification bias of the estimated model, the model is estimated again using the Two-Stage Least Squares (2SLS) regression. We include 1 lag of all variables except inflation in the instrument list. The results of the 2SLS regression produced in Table 2 also suggest that single-digit inflation undermines economic growth in South Africa.

TABLE 2: TWO-STAGE LEAST SQUARES REGRESSION RESULTS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-0.549400	3.338531	-0.164563	0.8702
DINFL	-1.183390	0.475128	-2.490677	0.0175**
LDIS	2.151473	0.958905	2.243678	0.0311**
LOSFIS	0.118824	0.728515	0.163105	0.8713
LSIZE	0.492150	1.338244	0.367758	0.7152
LOPEN	-0.626561	0.973992	-0.643292	0.5241
R ² =0.78, Adjusted R ² =0.75				
F-stat=31.03288 (0.000000)				

Instrument list: LGDPPC (-1) LDIS (-1) LOSFIS (-1) LOPEN (-1) LSIZE (-1) ***, ** and * represent 1%, 5% and 10% significance levels

However, it is possible that our disregard for threshold level of inflation within the single-digit inflation zone has produced these results. To address this concern, a new equation is estimated in which inflation rates up to 7% are assigned the value of 1 and inflation rates above 7% threshold are assigned the value of 0. The decision to use 7% threshold level is informed by a recent study on the threshold effect of inflation on economic growth (Adusei,

in press) which finds 7% threshold level beyond which inflation significantly hurts economic growth in South Africa. The results (Table not reported but is available on request) show a negative, statistically insignificant relationship between inflation and economic growth.

6. Conclusion and Limitations of the Study

The paper investigates whether single-digit inflation has any positive effect on economic growth with annual time series data from South Africa. Evidence from the analysis demonstrates that single-digit inflation undermines economic growth in the long run. The paper, therefore, submits that inflation targeting in the single-digit threshold may not be in the best interest of a developing economy like South Africa.

The paper has relied on the data from survey reports gathered by the World Bank (<http://www.worldbank.org>). Thus, the validity of its conclusion is limited to the extent to which these data are credible. We would, therefore, recommend a follow-up study using a different dataset. Another weakness of the paper, which could be an agenda for future research, is its failure to establish short run relationship between single-digit inflation and economic growth. Notwithstanding these weaknesses, the paper provides the basis for single-digit-inflation-targeting developing countries to be circumspect in their single-digit-inflation-targeting drives.

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